DOCUMENT RESUME

ED 413 939 JC 970 598

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TITLE	The Changing Role of Community College Faculty.
PUB DATE	1997-12-00
NOTE	66p.; Master of Education paper in High Education.
PUB TYPE	Dissertations/Theses (040) -- Information Analyses (070)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*College Faculty; *Community Colleges; Decentralization; *Educational Change; *Educational Technology; Faculty Development; Futures (Of Society); Organizational Development; *Part Time Faculty; *Teacher Role; Technological Advancement; Two Year Colleges
IDENTIFIERS	Information Age

ABSTRACT

Designed for use by community college practitioners in planning for changes related to the advent of the Information Age, this paper provides an overview of the literature addressing the changing role of college faculty. The first section provides a context for the changes, focusing on forces acting upon the colleges, such as the economic requirements of the Information Age and changing student demographics, and the effect of these pressures on organizational structures and delivery mechanisms. The next section addresses changes in the management of student learning, describing the recent paradigm shift from teaching to learning and the changes that will be required in college structures and functions to adopt the learning paradigm. The following section describes the increasing use of part-time faculty in community colleges, part-time faculty characteristics, and concerns and solutions related to their use. The next section focuses on managing technology, exploring the benefits of networking technology in making instruction accessible and its effects on the traditional one-way model of delivery. The final section provides a summary of issues and outlines changes in faculty roles from workers in the old paradigm to managers in the new learning paradigm, as well as organizational decentralization that will accompany these changes. Contains 70 references. (BCY)

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ED 413 939

The Pennsylvania State University

The Graduate School

College of Education

The Changing Role of Community College Faculty

A Master's Paper in

Higher Education

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Education

December 1997

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The Changing Role of Community College Faculty

Abstract

Faculty comprise what is known as the "technical core" within colleges and universities. They perform the work which is most directly related to these institutions' most important transformation process — teaching and learning. Rethinking the work of faculty has become a popular topic in the higher education literature today. The purpose of this paper is to provide the community college practitioner with an overview of this topic, placing it in the context of the broader literature available in higher education and management theory today, which they can apply to the work they do. Its focus is on answering the question raised by Scott "How can the structure of the technical core be modified so as to accommodate more demanding tasks?"(1992). The paper is organized around three areas which are expected to impact the structure and function of community college faculty in the future: (1) managing student learning, (2) managing the use of part-time faculty, and (3) managing the use of technology.

An examination of the literature in each of the areas listed above revealed that the structure of the technical core will be modified following Scott's principles for change based on the relationship between an organization and its environment (1992). As the work of community college faculty becomes more complex, the faculty will need to become more complex performers, taking on new roles required by the Information Age. In addition, the colleges themselves will become more structurally complex, as they attempt to support the faculty's new roles. As the work of community college faculty becomes more technically uncertain, the structure of that work will become less formalized and less centrally controlled — disciplinary specialties will be replaced by instructional specialties and a life governed by the academic calendar will be replaced by one in which the use of time is individually negotiated. Faculty will become managers of all aspects of the learning process.

The Context

> *Since systems continually interact with their external environment, ongoing viability depends on how well they can adjust to environmental changes. Systems thrive when they become critical to the success of the larger system. As a result, strategies for the Information Age should reflect an outside-in priority: what's best for the community, what's best for the college, what's best for the unit, what's best for the staff.* (Lorenzo and LeCroy, 1994, 16)

This statement summarizes a common theme found in both the literature of higher education and management and in interviews specifically conducted by the authors with community college leaders — the realization that a shift in focus will be necessary in order for community colleges to thrive in the coming century. But more than that, it establishes a framework through which one can view impending changes in the way that all colleges carry out their work. It highlights the underlying assumption for this paper — that faculty work, colleges, and higher education itself are all systems embedded in and inextricably linked to a larger social system. This paper will follow the framework provided, beginning with an overview of the current forces at work in the environment for higher education and moving to a more detailed review of the literature related to the changing role of community college faculty in the coming century as they adapt to this new environment.

The Information Age

During the 1980's, the United States economy began the transition from the industrial to the information era. The nature of work began to change as jobs in the manufacturing sector declined while those in the service sector increased. Service sector organizations are characterized by their processes, which "transform resources into intangible outputs, creat[ing] time or place utility for

their customers," rather than by the creation of a material good (Griffin, 1996, 648). It is within this sector that information and the related technology that creates, manipulates, and distributes information have become a new type of "capital good" (Tapscott and Caston, 1993). With the advent of new information technologies and services, organizations in both economic sectors have come to recognize the use of information as a essential factor required for growth in almost any industry (Davis and Davidson, 1991). Improved access to and usage of information has created a new economic environment which is increasingly fast-paced and competitive. Tapscott and Caston cite seven driving forces which will shape the work of organizations in this new economy: (1) productivity, (2) quality, (3) responsiveness, (4) globalization, (5) outsourcing, (6) partnering, and (7) social and environmental responsibility (1993).

Demographics

At the same time that this economic shift is taking place, changes are occurring in the demographic makeup of American society. The "baby boomers," a key age group noted particularly for its size, have entered the workforce. By the early 1990's, it was estimated that almost 85% of those who would be working in the year 2000 were already part the workforce (American Association of Community Colleges [AACC], 1993). The majority of this generation had completed their education before the end of the Industrial Era. The cohorts which follow, who will make up the remaining 15% of the workforce, are expected to bring a greater level of diversity to the workplace. However, as the American school system has already learned, they often "bring with them the challenges of cultural transitions, economic disadvantage, and a native

language other than English" (Fjeldstad, 1990, 1). For some, these challenges are so great that an estimated one million drop out of high school each year (Fjeldstad, 1990).

In a society where the knowledge base is described as virtually doubling every two to three years, we find that our workforce is composed of a majority who were educated for a different era and a new generation who must overcome a variety of serious obstacles in order to obtain their education. These two opposing forces are creating a "human capital crisis" — a predicament in which the skills of the workforce do not match the country's economic needs (Fjeldstad, 1990). This is happening at a time when the same catalyst, information, is fueling competition on a global scale.

Higher Education

This is the environment within which our country's higher education system resides. McPherson and Schapiro describe it as one in which higher education simultaneously "competes with and complements other social institutions in providing what might broadly be called 'intellectual capital'" (1995, 30). Its primary service, the production and transmission of knowledge, is desperately needed by a society that requires a "world-class workforce and an informed consumer population" (Fjeldstad, 1990, 1). Clark Kerr, a leading thinker on issues related to higher education, has noted, "higher education is now too important both politically and economically to be ignored" by society (1994, 12).

In this context, higher education has its own set of driving forces which are shaping the work of its member institutions. These are: (1) a shrinking pool of "traditional" funding resources, (2) increasing competition for existing resources, (3) a changing student population, (4) the increasing use of information technology, and (5) public demands for accountability. The United States government has traditionally been one of higher education's primary sources of funding; however, "the taxpayers have revolted . . . [while] simultaneously, competition for public resources has increased — for health care, for child care, for care of the aged, for care of prisoners, among others" (Kerr, 1994, 12). Higher education is forced to compete with other publicly funded services for many of the resources it needs. At the same time, it is being asked to provide services to a growing and increasingly diverse population. New types of students, including adults over age 25 and "a larger proportion of historically under-represented groups," people from low-income or first-generation in college households, are expected to enroll in greater numbers by the turn of the century (Zusman, 1994, 344).

The growth of information technology so prevalent in the service sector has reached higher education as well. The need to purchase sophisticated equipment which can collect, analyze, and impart information, is turning higher education into both a capital and labor intensive industry (Keller, 1993). Again, this is happening in a social system characterized by limited resources. Clark Kerr notes that as American society gives increasing priority to the "advancing of human capability," it is demanding greater accountability for each of the educational dollars it spends (1994, 12). Accountability brings public mandates and increased reporting requirements from a

variety of external agencies. Americans feel they have a greater stake now, more than ever before, in the outcomes of higher education.

Community Colleges

Community colleges reside within this general environment of the American system of higher education. These colleges constitute the public two-year sector which offers both academic and vocational coursework at the associate degree level. Cohen and Brawer describe this sector as:

> a twentieth-century phenomenon . . . firmly set in the landscape of American education. With five million students enrolled in institutions in every state, the two-year colleges constitute an important sector . . . they stand alone as important units of analysis, worthy of study in their own right. The community colleges provide prebaccalaureate and occupational entry education for many students who would not otherwise participate in postsecondary studies. (1994, 5)

Community colleges share many of the same challenges that the larger system of higher education is facing today. An analysis by The Institute for Future Studies at Macomb Community College highlighted several issues facing community colleges in the 1990's. They include: managing public policy and public opinion, working with limited resources, documenting results, staffing for the next generation, utilizing technology, and providing workforce education (Lorenzo and Banach, 1992).

The issues facing American organizations in general, higher education, and community colleges, while not identical, do contain a set of related themes brought on by the transition to an information-based economy. These include: social obligation, limited resources, technological change, and accountability. Each of these systems must address the issues as they manifest

themselves in their particular environment if they are to remain viable and provide support to the larger system. Among the sectors in higher education today, community colleges are uniquely positioned to respond directly to several of these challenges. Dan Angel, President of Austin Community College, explains:

> To regain public confidence, higher education must adapt itself to assist in solving these problems. It must prepare a competitive workforce by reaching out to include and educate effectively populations of students who have previously been excluded. This challenge plays to the long suit of community colleges and they have a responsibility for leading the resurgence of higher education in the 1990's. (1990, 2)

It is for this reason that I have selected community colleges as the level of analysis for this paper.

Theory and Practice

Organizational Structure

Literature in the areas of organizational theory and management can be used to characterize the impact of the environment on an organization. The environment is often depicted as having two layers. First, the general environment consists of "the set of broad forces . . . that create an overall context" for an organization; these include its larger economic, political, social, or technological context (Griffin, 1996, 71). Second, the task environment consists of "specific organizations or groups that affect the organization" (Griffin, 1996, 71). There are five dimensions to any organization's task environment: its customers, suppliers, regulators, competitors, and allies (Griffin, 1996). Scott summarizes the relationship between an organization and its environment with two principles: (1) greater technical complexity [in the environment] is associated with greater structural complexity [in the organization]; and (2) greater

technical uncertainty [in the environment] is related to lower formalization and centralization [in the organization] (1992, 253)

The degree of technical complexity refers to "the number of different items or elements that must be dealt with simultaneously by the organization" (Scott, 1992, 230). The community college environment has become increasingly complex, with demands for accountability bringing increased regulation, limited resources bringing increased competition, and rapidly changing technology bringing increased costs. Technical uncertainty refers to "the variability of items or elements upon which work is performed or the extent to which it is possible to predict their behavior in advance" (Scott, 230). Community colleges face a great deal of uncertainty in a sector where an open admissions policy invites students of varying abilities to take advantage of its services, and a rapidly changing environment where public opinion and need have become hard to predict.

Scott also notes an important exception to his first principle — professional organizations. In these types of organizations, "technical complexity does not invariably give rise to greater complexity of structure; it may give rise instead to greater 'complexity' of the performer" (Scott, 1992, 253). Scott specifically cites the work of colleges as requiring a special type of worker that he describes as a "professional," that is a "more highly qualified and flexible performer" (253). He also explains that as complexity and uncertainty increase, "professionals are more likely to move their work into organizational structures [in order to] take advantage of a more explicit division of labor and more formalized coordination mechanisms" (253). This is consistent with Altbach's

description of academics as "at the same time both professionals and employees of large bureaucratic organizations" (1994, 231).

The Technical Core

In organizational theory and management literature, the term "technology" refers to the "the conversion processes used to transform inputs into outputs" (Griffin, 1996, 326). An organization's core technology is its most important transformation process. The workers who are directly involved in that process are called the technical core. For an educational institution, and particularly community colleges, the teaching-learning process represents the primary work that it performs (Cohen and Brawer, 1994). The members of the organization that contribute most directly to this process are its faculty.

The typical organization will attempt, as much as possible, to "seal off their technical core from environmental disturbances" (Scott, 1992, 227). It does this by employing both "buffering" and "bridging" processes. Buffering processes are designed to "close the system artificially to enhance the possibilities for rational action" on the part of the members of technical core (Scott, 194). These strategies can include: classifying inputs, leveling the fluctuation of inputs or outputs, forecasting anticipated changes in supply or demand, and adjusting the scale of the technical core (Scott, 1992). A college's use of admissions and assessment testing policies, enrollment management practices, and varying forms of instruction are all examples of attempts at buffering their faculty from the environment. Bridging processes are designed to "enhance the security of the organization in relation to its environment" (Scott, 197). These strategies can include:

bargaining with external groups, establishing contracts with customers or suppliers, incorporating members of other organizations into its governance structures, conducting joint ventures, creating associations, and establishing connections with the government (Scott, 1992). Colleges who engage in partnerships with other educational institutions, invite members of the community to serve on advisory boards, and hold memberships in professional education associations, are all employing bridging strategies in an effort to maintain their position within their environment.

These efforts directed at protecting the technical core can cause organizations to be characterized as behaving "most typically when it maintains the status quo [and] doesn't change in sync with its environment" (Griffin, 1996, 362). Many believe that it is this phenomenon which is responsible for creating the forces of increasing complexity and uncertainty which community colleges face in their environment. Lorenzo and LeCroy believe that:

> most of the problems experienced in America today can be attributed to the gradual demise of the Industrial Age and the emergence of a new era . . . most commonly referred to as the Information Age . . . our social institutions . . .have not yet been able to transform themselves to meet the conditions and requirements of a new age . . . our problems . . . [emanate] from overall "lack-of-fit" (1994, 15).

Change

Some of the business organizations that Lorenzo and LeCroy examined as part of their research have already been able to address this "lack-of-fit" by transforming their products and processes to better conform to the requirements of the new age (1994). Griffin uses the term "reengineering" to describe "the radical redesign of all aspects of a business to achieve major gains in cost, service, or time" (1996, 362). Proposals for this type of change have also begun to appear within higher education. Lorenzo and LeCroy conclude with the warning for community

colleges that the "greatest danger could well be to assume that only incremental rather than fundamental change will be needed to succeed in the future" (1994, 19).

A change of this magnitude would include an examination of the organization's structure and design, technology and operations, and human resources (Griffin, 1996). Redesigning the work of the technical core would be central to this process. It is for this reason that faculty issues have become a popular topic in the higher education literature today. Writers such as Alan Guskin invite us to take up "the challenge of rethinking the role of faculty and the use of new technologies" (1994, 18). In examining the issue of the increased use of part-time faculty among community colleges, Roueche, Roueche, and Milliron ask, "Is there a need for a new class of employee?" (1995, 20).

In his discussion of sources of complexity in the technical core, Scott asks a common question "How can the structure of the technical core be modified so as to accommodate more demanding tasks?" (1992, 227). A review of the literature suggests that any new structure will most likely include a combination of managing the following functions: student learning, part-time faculty, and technology. The remaining sections of this paper will examine these three areas and their impact on the role of community college faculty in the future.

The Faculty

Faculty represent the "technical core" of higher education. As such, they are subjected to the same external forces as this system in which they work. One of the key questions which higher education is being asked by public policy makers today is "What do faculty do?" — the implication of this question is "what do faculty contribute to the problems we need to solve" (Ludwig, 1996, 67). Higher education's researchers, theorists, and administrators pass the pressures of social obligation, limited resources, technological change, and accountability on to the faculty as they search for an answer to this question. The prediction made by Dooris and Lozier, that "academic managers of the 1990's will likely face a complex set of challenges in the management of faculty resources" has come to pass (1989, 89). For the purposes of this paper, the faculty will be considered as a single entity, an institutional resource, rather than as the autonomous units that we so often consider them to be.

As a resource, the faculty have organized themselves to provide instruction within colleges and universities. Davis explains that the present structure of faculty within our educational organizations was determined by changes that happened at the end of the 19th century (1995). He highlights four changes that occurred which shaped how faculty work: (1) disciplines and professional fields emerged; (2) departments were developed at the institutional level; (3) graduate education was established; and (4) the lecture teaching method replaced the recitation and disputation methods (1995, 16). The overall theme found in these changes was the driving force of specialization which was suited to the needs of the industrial era. The faculty at most colleges and universities today continue to work within the structures described above — they

receive graduate level training in a specific disciplinary field, organize their work into departments, and provide the majority of their instruction through lectures.

Altbach notes that while the hold of this traditional academic structure remains strong, "variations among the different sectors within the academic system . . . also shape the academic profession" (1994, 227). The National Center for Education Statistics [NCES] reports that public two-year colleges employ the largest number (at 253,711) of faculty and instructional staff of any sector in higher education (1994). Community colleges were founded with the intent to extend educational opportunities; this has "resulted in a diversity of learners beyond the breadth of any other education institution" (Witt, Wattenbarger, Gollattscheck, & Suppiger, 1994, xii). The work of this particular segment of the faculty has been shaped by the students they serve.

In the most recent national survey of faculty conducted by the Higher Education Research Institute, community college faculty report that their primary interest (96 percent) and their principal activity (96 percent) is teaching (Sax, Astin, Arredondo, & Korn, 1996). One hundred percent (100%) of the respondents from public two-year colleges indicated that "being a good teacher" was a very important or essential professional goal (Sax, et al., 1996). Community college faculty reported spending significantly more time teaching — 77% indicated that they spend more than 12 hours per week — than the faculty respondents in general (Sax, et al, 1996). These faculty also indicated that the efforts of their teaching have a slightly different focus, 83% reported that a very important or essential goal for undergraduate education was to prepare

students for employment after college (Sax, et al, 1996). Preparing students for the world of work is one of the primary missions of community college faculty.

The teaching workload of community college faculty would be considered heavy by many of their counterparts in other sectors of higher education. An additional challenge faced by community college faculty is that their work carried out by a much smaller core group. NCES reports that colleges and universities typically employ two-thirds of their faculty and instructional staff on a full-time basis, while less than one-half (47%) of public two-year faculty and instructional staff are employed full-time (1994). These workload issues are not expected to change for community college faculty anytime in the near future. Cohen states that, similar to their counterparts throughout higher education, "with rare exception, the [community college] faculty tend to teach in the same ways, to the same number of students, for the same number of hours as their predecessors did a generation ago" (1992, 161). Thus community college faculty suffer from the same "lack-of-fit" and many of the same pressures for change from their environment as the rest of higher education.

Forces for Change

Recently, there have been significant challenges raised against the current specialized structures which provide the basis for faculty work (Davis, 1995). In a critical article published in *Change* magazine, Alan Guskin challenges that "colleges and universities are locked in an unexamined educational delivery system that is increasing in costs while, at best, maintaining a steady state in student learning . . . the unacceptability of student costs will drive us to change" (1994, 25).

Guskin considers a fundamental restructuring of the work of faculty members to be one of the only means by which a college or university can achieve a significant cost savings (1994). Davis points out that when "applied to postsecondary instruction, reengineering means changing radically the arrangements for instructional delivery" (1995, 21). While some suggest the solution will be found in a form of differentiated staffing, others look to technology, and still others call for a renewed focus on student learning, they are unified in their focus on examining and changing colleges' current instructional delivery systems (Cohen, 1992; Guskin, 1994; Davis, 1995). For many colleges, new instructional delivery systems will incorporate the use of all three suggested solutions. What will the work of community college faculty look like as they manage the use of new theories of student learning, part-time faculty, and technology?

Managing Student Learning

> *A paradigm shift is taking hold in American higher education . . . the paradigm that has governed our colleges is this: A college is an institution that exists to provide instruction . . . we are shifting to a new paradigm: A college is an institution that exists to produce learning . . . This shift changes everything.* (Barr & Tagg, 1995, 13)

The statement above neatly summarizes the thoughts of many scholars of higher education today. A review of the current literature shows countless articles which attempt to describe the individual changes which many researchers and practitioners have already perceived are taking place in many aspects of higher education. Barr and Tagg have packaged several of these singular notions into an overall framework — a paradigm (1995). They describe a paradigm as similar to the "rules of a game" with its primary function being "to define the playing field and the domain of possibilities on that field" (Barr & Tagg, 1995, 15). While they believe that we are just beginning the age of the Learning Paradigm, and that no one has yet defined all of its elements, they are confident that this shift will help to realign the structures within higher education with the needs of the larger socio-economic system.

Gardiner reports that the skills most frequently identified by leaders in business, government, and education as essential to society's economic and democratic success are: critical thinking and problem solving, respect for others, principled behavior, lifelong learning, interpersonal skills, and teamwork (1994). The development of these skills requires advanced cognitive abilities — abilities that are cannot be developed using the tools and techniques of the Instruction Paradigm (Gardiner, 1994). Barr and Tagg point to "the gap between what we say we want of higher

education and what its structures provide" as an impetus for this impending paradigm shift. The shift to a Learning Paradigm will impact institutions on six dimensions: purpose, learning theory, criteria for success, productivity, teaching/learning structures, and the nature of roles (Barr & Tagg, 1995).

Purpose

In their text, Changing College Classrooms, Diane Halpern and Associates attest that in their research, they have found that "for an increasingly large number of colleges, student learning has emerged as the reason for higher education and is being recognized as the primary mission of faculty" (1994, 350). There are two powerful implications associated with this shift in purpose. The first is a change in the nature of the actual service that education provides from one that focuses on how faculty teach to one that emphasizes how students learn (Guskin, 1994). The second is a change in the technology used from one in which colleges deliver instruction to one in which colleges create learning environments (Guskin, 1994; Barr & Tagg, 1995).

Learning Theory

In his article, "Reengineering Teaching for 21st Century Learning," James Davis reminds us that "in the information age, overwhelming with both its volume and its detail of information, far more attention will need to be paid to what to do with information: how to access, criticize, interpret, and use it" (1995, 17). He goes on to explain that, in the future, students will need to learn to make connections, synthesize, and apply disparate sources of information in order to create new knowledge. In a similar vein, research shows that "college faculty agree almost universally that

the development of students' higher-order intellectual skills [i.e. critical thinking and problem solving] is the most important educational task of colleges and universities" (Gardiner, 1994, 7). Both imply that colleges will need to find ways to integrate the discipline-based "chunks" of information that students currently receive into a more holistic set of skills that can be applied in their work and personal lives.

At the same time, in the report "Redesigning Higher Education: Producing Dramatic Gains in Student Learning," Gardiner provides a review of the research literature on student learning which shows that the "impact of college is largely determined by the individual's quality of effort and level of involvement" (1994, 21). Additional research also tells us quite a bit about the conditions that can advance student development. These include: creating a challenging yet supportive environment, allowing for active involvement in learning, setting high expectations, and providing frequent assessment and feedback (Gardiner, 1994). Research in other sectors of education has shown that by adapting instructional methods to students' learning needs success can be achieved — even with "students of modest academic origins," the mainstay of community college enrollments (Gardiner, 1994). Overall, educational research shows that gains in student learning are best achieved when the student is actively engaged in a learning environment tailored to their needs.

The Learning Paradigm includes elements of learning theory that reflect both the new need for integration of information and the recent research findings on the conditions required to optimize learning. Here, knowledge is no longer defined as "bits" determined and delivered instructors;

but, as "frameworks . . . that are created or constructed by the learner" (Barr & Tagg, 1995, 21). The Learning Paradigm "frames learning holistically, recognizing that the chief agent in the process is the learner" (Barr & Tagg, 1995, 21). One of its primary objectives is to guide educators in creating learning environments that are "challenging . . . cooperative, collaborative, and supportive" (Barr & Tagg, 1995, 23).

Criteria for Success

"A meaningful assessment of learner outcomes is the only way . . . to determine what works in higher education" (Halpern, 1994, 269). One of the main effects of the assessment movement has been to shift the focus of measurement and quality in higher education away from "inputs" and more toward "outcomes." The Learning Paradigm incorporates the principles of assessment, while taking them one step further in establishing criteria for success. In this new paradigm, "the power of an environment or approach is judged in terms of its impact on learning" (Barr & Tagg, 1995, 17). Colleges are expected to become organizations where learning technologies are continuously developed, monitored, and refined.

Productivity

In his article, "Restructuring the Role of Faculty," Alan Guskin argues that our "thinking about faculty productivity is undermined by unexamined assumptions about how faculty members influence student learning" (1994, 18). In the Instruction Paradigm, a classroom setting is believed to be essential for effective student learning. In this setting, productivity is defined as the number of sections or students taught. Guskin maintains that the "issue is not how many courses

faculty teach, but how much students learn" (1994, 18). In the Learning Paradigm, productivity is measured by the cost per unit of learning (Barr & Tagg, 1995).

Teaching Learning Structures

"Structures . . . [are] those features of an organization that are stable over time and that form the framework within which activities and processes occur and through which the purposes of the organization are achieved" (Barr & Tagg, 1995, 18). Earlier, the structure of faculty work organized into disciplines, departments, and lectures was described. To this list of structural features from the Instruction Paradigm, Barr and Tagg add the semester, the three-credit course, and grading (1995). The structure of an organization is one of the most important features to consider when attempting to increase productivity or alter outcomes because "restructuring offers the greatest hope for increasing organizational efficiency and effectiveness" (Barr & Tagg, 1995, 18).

Barr and Tagg describe the teaching/learning structure in the Instruction Paradigm as "atomistic," where "the 'atom' is the 50-minute lecture, and the 'molecule' is the one-teacher, one-classroom, three-credit-hour course" from which almost every other college structure is derived (1995, 19). However, the current educational literature discussed briefly in the preceding sections, "presents a clear message that the primary learning environment for undergraduate students . . . is contrary to almost every principle of optimal settings for student learning" (Guskin, 1994, 20). In HERI's most recent survey of faculty, about one-half of instructors reported using the lecture format (Sax, et al, 1996). Halpern notes that an "active and motivated nature of learning is not optimized

in the old style classrooms where students sit quietly, passively receiving the words of wisdom being professed by the lone instructor" (1994, 11). Gardiner's review of the educational research literature shows that what is needed are "diverse forms of individualized instruction that respond to students widely divergent styles and rates of learning" (1994, 114).

Barr and Tagg explain that "in the Learning Paradigm college, the structure of courses and lectures becomes dispensable and negotiable" (1995, 20). In his review of several research-based methods of instruction, Gardiner includes the concept of Mastery Learning (1994). Mastery Learning "eliminates time as the independent variable in learning and replaces it with mastery of a specific, preidentified knowledge and skills, allowing variable amounts of time according to the needs of individual learners and thus removing a major barrier to success" (Gardiner, 1994, 115). Similar to some of the open-entry/open-exit courses being designed now in community colleges, the Mastery Learning concept would radically alter the three-credit-hour, semester-long, lecture course that is the staple offering of most colleges today.

Both Davis (1995) and Gardiner (1994) view these impending structural changes as a sign of a movement away from an older form of "mass education" to a newer form of "individualized mass instruction." Both attribute this shift to the need to resolve the tensions between organizational size and effectiveness. As community colleges have grown and continue to serve a larger number of students, they will need to create smaller working units in order to effectively plan, provide, and monitor student learning (Davis, 1995). This follows Scott's first principle, that greater

technical complexity in an organization's environment can lead to greater structural complexity within the organization.

Nature of Roles

In a study conducted in the mid-1980's on ways of strengthening teaching and educational effectiveness in community colleges, Earl Seidman had already foreseen changes in faculty roles (1990). In discussion related to the teaching workload of community college faculty, Seidman noted that "if time is to be made available to community college faculty, it will come from reconceptualizing their role and relationship with students" (1990, 45). The shift by colleges from the Instruction Paradigm to the Learning Paradigm will obviously require a change in the nature of faculty roles. Its impact on the five dimensions of the institution — purpose, learning theory, criteria for success, productivity, and teaching/learning structures — that were previously discussed all have implications for the work of the faculty.

As the purpose of the institution changes from one that provides instruction to one that creates learning environments, it is the faculty who will act as designers of those contexts, "study[ing] and apply[ing] the best methods for producing learning and student success" (Barr & Tagg, 1995, 24). As the new learning theory is applied throughout higher education, its emphasis on the student as an active participant in the learning process will cause the role of the faculty to be transformed from one of the "expert dispenser of information" to one of the "teacher as coach or facilitator" (Cooper, Robinson, & McKinney, 1994, 76). As the criteria for success begin to emphasize the outcomes and impact of our processes on student learning, faculty will be become classroom

researchers in order to provide continuous feedback and documentation of the results of their efforts (Nummedal, 1994; Ludwig, 1996). As the definition of productivity changes from one that is measured solely by the number of faculty contact hours with students, the students will spend far more time learning by themselves, with their peers, and by interacting with technologies than with faculty members (Guskin, 1994). The faculty will then be able to spend more time working as team members on interdisciplinary and functional design groups where they will be able to design environments that maximize student learning in ways that cannot be achieved by disciplinary specialists working alone (Swope, 1994; Barr & Tagg, 1995; & Davis, 1995). As the teaching/ learning structures of the Instruction Paradigm — departments, semesters, courses, and lectures — evolve into the individualized instructional methods of the Learning Paradigm, faculty will become brokers of educational experiences tailored from a variety of potential techniques to suit each specifically defined population of students.

Changing the structures and functions of colleges to follow the model set forth by the Learning Paradigm will not be easy. It will mean changing our technology and the work of the technical core, which so many features of the institution are designed to protect. "College teachers are being challenged to examine their basic beliefs and assumptions about the nature of the teaching/learning process, to examine their basic practices as instructors, and to revisit questions of both what and how they teach . . . whom they teach . . . and reconsider where they teach." (Nummedal, 1994, 290). New roles as designers, facilitators, researchers, team members, and brokers will require the use of "more modern professional methods" of instructional design, for

which "the current professoriate will require significant assistance in developing the diverse professional knowledge and skills now required to educate our students" (Gardiner, 1994, 113) Managing student learning will require a new type of educational professional. The changing work of community college faculty follows Scott's exception for professional organizations — greater technical complexity will give rise to greater complexity of the performer.

Managing Part-time Faculty

> *What we thought the academic community needed to hear was that part-time faculty are among us in substantial numbers. They do important work for our institutions, and they are likely to continue to do so in the future. We can neither ignore their presence nor engage in the wishful fantasy that some day all faculty will be full-time and on the tenure track.* (Gappa & Leslie, 1993, 7)

The use of part-time, temporary, or contracted workers as a subset of the United States labor force has increased significantly over the last few decades. In 1995, Avakian noted that "one in three American workers in today's economy is a contingent worker" (p.35). Organizations in the service sector, such as colleges and universities, are particularly noted for their heavy reliance on the use of part-time workers (Feldman, 1990). Increased flexibility is one of the most commonly cited reasons for the growth of this sector of the workforce (Avakian, 1995).

Many of the environmental pressures faced by higher education in general, and community colleges in particular, which were described earlier as forces of change are also driving the increased use of part-time faculty in these institutions. The "pressures to improve the quality of undergraduate education and changes in the nature of the students entering higher education have generated incentives to employ part-time faculty" (Gappa & Leslie, 1993, 121). Conditions such as the growth in the number of adult learners, increased competition, and shifts in enrollment patterns were already noted in the early 1980's as creating disincentives for making the long-term commitment to hiring new full-time faculty (Tuckman & Tuckman, 1981). In the 1990's, escalating demand for access to education, declining revenues, and increasing demands for

accountability have been added to the list of environmental trends that encourage the use of part-time faculty (Gappa & Leslie, 1993; Roueche, Roueche, & Milliron, 1995).

In addition to these pressures in the external environment, there is also a unique internal factor that is thought to impact the increased use of part-time faculty. Within the academic labor market itself, the issue of an "aging faculty" is a growing concern (Magner, 1997). On one hand, the size of the singular cohort of baby-boomer faculty is predicted to create a shortage, as Gappa and Leslie explain:

> Tenured faculty in some fields have aged together since the expansion years of the 1960's . . . these departments will experience the virtually simultaneous retirement of most of their faculty . . . demand for new faculty exceeds the supply of available talent in some fields over the next several decades, part-time faculty will help fill the gap (1993, 118).

Another side to this trend highlights concerns related to the end of mandatory retirement for faculty at age seventy. Magner reports, "what concerns many professors and administrators . . . is the ability of departments and universities to bring in new blood" (1997, A11). Some institutions are currently looking to the younger, part-time faculty to fill this role until the large cohort of full-time, baby-boomer faculty moves into retirement.

Community colleges are often particularly noted for their use of part-time faculty. Part-timers have been employed by community colleges since they were first established, but their use has increased dramatically since that time. Roueche, Roueche, and Milliron document this phenomenon, reporting that in 1966, 38 percent of community college faculty were employed part-time, while in 1980 that percent had increased to between 50 and 60 percent, and in 1992 it

had increased again to between 55 and 65 percent (1995, 3). Their recent national study revealed that, "in the average community college, almost one out of three courses is taught by a part-time faculty member" (Roueche, Roueche, & Milliron, 1995, 31). During approximately this same period, from 1971 to 1991, the number of full-time faculty teaching in community colleges increased only 15 percent (Roueche, Roueche, & Milliron, 1995, 3). The authors observed that with the "challenges of escalating demands for their services and declining revenue streams, American community colleges are finding it more and more difficult to meet these demands with their current cadre of full-time faculty" (Roueche, Roueche, & Milliron, 1995, vii).

Who are the part-time faculty?

Research on part-time faculty is a relatively recent phenomenon. In a review of the literature published by the Educational Research Information Clearinghouse (ERIC), Banachowski reported that most of the research conducted on part-time faculty has happened only since the late 1980's and has focused on their characteristics and working conditions (1996). One problem that researchers have had in studying part-time faculty issues is the heterogeneity of this group (Emmet, 1981; Spangler, 1990).

Some studies have attempted to classify part-time faculty based on their motivations for teaching. The research most commonly referred to in this area is the Tuckman Taxonomy (Emmet, 1981). In 1978, Tuckman developed seven categories of part-time faculty meant to describe their motivations and conditions of employment: (1) Hopeful Full-timers, (2) Full-mooners, (3) Homeworkers, (4) Students, (5) Part-mooners, (6) Semi-retireds, and (7) Part-unknowners

(Emmet, 1981, 1). In 1993, Gappa and Leslie updated and simplified the Tuckman Taxonomy into four categories: (1) Career Enders, (2) Specialists, Experts, Professionals, (3) Aspiring Academics, and (4) Freelancers (p. 45). This revision was based on new data available from their own study and from the 1993 National Study of Postsecondary Faculty which revealed that "77 percent of part-timers are employed simultaneously elsewhere" and that "52 percent of part-timers prefer to work part-time" (Gappa & Leslie, 1997, 10). Earlier research conducted by Gappa revealed that the top two reasons part-time faculty gave for teaching were personal satisfaction and professional development (1990). These statistics help to dispel common myths that all part-time faculty are either seeking a full-time teaching position or teach for solely economic reasons.

In addition, Gappa and Leslie found that part-time faculty generally hold a degree at a level equivalent to their full-time counterparts, at the community college this would be a Master's degree (1993). They also found that many part-time faculty had taught at their institution for extended periods of time (Gappa & Leslie, 1993). Both of these findings indicate that the level of education and years of teaching experience which part-time faculty possess is in many cases equivalent to that of their full-time counterparts — dispelling another common assumption that all part-time faculty have inferior credentials or lack teaching experience. Roueche, Roueche, and Milliron conclude that the "diversity of their demographic characteristics, their academic backgrounds, their experiences, and their motivations to teach part-time makes it impossible to assign them simple or inclusive labels" (1995, 6). Generalizations about "the part-time faculty" are difficult to make.

Why do we use them?

The reasons that colleges use part-time faculty have remained essentially the same over the last two decades. The primary reason cited in the literature is "flexibility" (Tuckman & Tuckman, 1981; Spangler, 1990; Gappa & Leslie, 1993; Roueche, Roueche, & Milliron, 1995). Pollock and Breuder explain that the use of the part-time instructor in community colleges "first evolved as the community expert in a particular discipline . . . the major impetus for hiring was almost always the fact that these personnel brought with them 'real world' information or subject area expertise not available within the department or to its students" (1982, 58). With time, the reasons for the use of part-time faculty expanded beyond just their role as a specialized expert. Institutions began to realize that there were other benefits to using part-time faculty, including: (1) more curricular flexibility, (2) a means of responding to fluctuating enrollment patterns, and (3) increased economic flexibility (Spangler, 1990). As Cohen points out, "they cost less, have special capabilities not available among full-time instructors, and they can be employed, dismissed, and re-employed as necessary" (1992, 161).

For many institutions the original emphasis on using part-time faculty as a means of achieving curricular flexibility has subtly shifted to an emphasis on using part-time faculty as a means of achieving economic flexibility. Today, Gappa and Leslie believe that the use of part-time faculty to achieve flexibility within programs and departments has become "a frequently used euphemism for saving money" (1993, 92). Spangler points out that in focusing on cost-saving efforts, "the attempts of community colleges to be responsive to their communities have created a temporary staff maintained on a relatively permanent and continuing basis" (1990, 3). Institutions that view

the use of part-time faculty as a primarily economic decision may be at risk of creating a dual labor market, which is the "result of institutional arrangements favoring the primary workforce and insulating that workforce from competitive market forces" (Gappa & Leslie, 1997). Recall that adjusting the scale of the technical core is one form of "buffering" that can be used by an organization in order to protect itself from environmental influences. The use of this particular technique is creating a change in "traditional faculty employment patterns" and in the "academic profile" of many institutions (Gappa, 1990; Gappa & Leslie, 1997). As Avakian points out, we are creating a "two-tiered workforce, one tier is composed of a decreasing core of full-time workers while the second tier includes a growing number who have no benefits and little access to training or opportunities to further their education" (1995, 35). This trend has raised concerns within the academic community.

Concerns

Concerns surrounding the use of part-time faculty are not new. In the early 1980's, Tuckman and Tuckman had already indicated that a "serious problem facing institutions that have opted to hire a majority of part-timers is how to maintain institutional integrity and identity" (1981, 7). Many academics at that time were focused on the perceived lack of quality in the part-timers themselves; however, subsequent research has "found no significant difference in student ratings, class retention, or student achievement in subsequent classes between students taught by part-time faculty and those by full-time faculty" (Roueche, Roueche, & Milliron, 1995, 10). Cohen points out the real differences between the work of part-time and full-time faculty lie in the "activities that an instructor conducts outside the classroom . . . maintain[ing] office hours, select[ing]

textbooks and media, plan[ing] programs and curriculum, serv[ing] on institutional welfare committees, and sustain[ing] a more involved professional posture" (1992, 162).

It is this aspect — their work and responsibilities outside of the classroom — of faculty roles that has raised more recent concerns about the widespread use of part-time faculty. Avakian points out that "as the percent of adjunct faculty members increases, there is greater pressure on the performance of permanent faculty members to meet the goals of the institution" (1995, 35). The permanent, full-time faculty members are "often charged with, and held responsible for, the quality of education in their departments" although they have little input into the manner or use of adjuncts in their department (Twigg, 1989, 6).

Gappa and Leslie summarize the current concerns found in the literature as two "false economies" in the use of part-time faculty (1993). The first is "failing to account for the burdens that accrue to full-time faculty as more part-timers take on teaching assignments" and the second, "assum[ing] that part-timers can teach as well as full-time faculty without the same level of support that full-time faculty enjoy" (Gappa & Leslie, 1993, 13). Full-time faculty are being "progressively drawn away from teaching assignments to handle advising, curriculum development, and program coordination" as well as to participate in governance and planning activities (Spangler, 1990; Gappa & Leslie, 1993, 102). Meanwhile, part-time faculty have begun to express increasing dissatisfaction with their second-class status (Gappa & Leslie, 1993; Roueche, Roueche, & Milliron, 1995). Gappa and Leslie conclude that, while

> "it may appear that employing part-timers who are paid low wages will save money . . . [this is] far too simplistic a way to calculate cost-effectiveness, and its leads to using part-timers for the wrong reasons . . . at some indeterminate point, adding

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part-timers creates substantial hidden costs to the institution" (1993, 102)

Further, the reason that quality appears to suffer with the use of part-time faculty is not attributable to the part-timers themselves, but "because the department or the institution becomes less able to carry out the infrastructure work" (Gappa & Leslie, 1993, 103).

Researchers in two recent national studies both cite the lack of a systematic plan for the use of part-time faculty in most institutions as their most disturbing discovery (Gappa & Leslie, 1993, Roueche, Roueche, & Milliron, 1996). Gappa and Leslie refer to these departments' use of part-time faculty as "out of control" (1993, 232). The characteristics of these "out of control" uses include:

- Program decisions are made for fiscal reasons
- Planning horizons were short and often externally driven
- Faculty staffing was ad hoc and driven by noneducational factors
- Policies on the use of part-time faculty were informal and capriciously administered
- Little or no centralized record keeping or monitoring existed
- Integration of part-time faculty into the institution and/or department was minimal
- Evaluation of performance was erratic or nonexistent (Gappa & Leslie, 1993, 232)

The continued use of these types of practices in the employment of part-time faculty contributes to the "bifurcation" of the academic profession into two separate faculties and the inability of community colleges to provide the types of quality educational services that its environment demands (Gappa & Leslie, 1993).

Solutions

Most community colleges need to get better control over their management of part-time faculty employment. Researchers who have investigated this issue, including studies of institutions that are noted for having "best practices" in this area, are emphatic in their belief that we must embrace the concept of "one faculty" (Avakian, 1995; Roueche, Roueche, & Milliron, 1995; Gappa & Leslie, 1997). Gappa and Leslie state:

> the current system of differentiating employment practices based on status in the academic profession works to undermine the collegial nature of the profession and the integrity of academic programs . . . coherent and effective academic programs require faculty to collaborate on the design of curricula and cooperate in teaching courses to achieve intended outcomes (1997, 21).

In their book, The Invisible Faculty, and in subsequent work, Gappa and Leslie emphasize that the hiring of part-time faculty should be part of an overall staffing plan that is based on educational, not fiscal, reasoning (1993 & 1997). They state:

> planned use derives from a clear statement of mission and a common view of why and how part-time faculty can contribute to the mission . . . planning the use of part-time faculty is critical to their ultimate success . . . academic quality is a product of institutional agreement about the proper use of part-timers and the adoption of policies, practices, and monitoring systems to ensure that part-time faculty are indeed employed for the reasons the institution expresses (Gappa & Leslie, 1993, 140).

More specifically, institutions need to examine the following processes in relationship to their use of part-time faculty: (1) recruitment, selection, and hiring, (2) orientation, (3) faculty development, (4) evaluation, (5) compensation, and (6) integration (Gappa & Leslie, 1993; Roueche, Roueche, & Milliron, 1995). The recruitment, selection, and hiring of part-time faculty should continue to be handled at the department level; however, it should be a more deliberate,

rigorous processes, involving others in addition to the department chair. In community colleges, hiring should require a demonstration of teaching abilities (Roueche, Roueche, & Milliron, 1995). Orientation should provide new part-time faculty with more than just an initial social event, it should be "part of a well-developed plan for acquainting faculty with the culture of the institution, the norms of the institution, the expectations of the college, and the roles of the new members" (Roueche, Roueche, & Milliron, 1995, 61). Relevant institutional policies and procedures should be provided in written form to part-time faculty as part of their orientation process. Faculty development programs should be "regular, systematic, and continuous throughout the academic year" and attended by both full- and part-time faculty (Roueche, Roueche, & Milliron, 1995, 87). Regarding part-time faculty evaluation, Gappa and Leslie observe that "those institutions most interested in the quality of instruction not only require standardized student evaluation forms of all faculty on a regular basis but also arrange for classroom visitation and direct observation by senior faculty" (1993, 168). In order to avoid creating a dual labor market within the institution, fair compensation should be provided for all types of instruction-related activities in which part-time faculty become involved (Gappa and Leslie, 1993).

The final and most novel recommendation is the complete integration of part-timers into the faculty. In their book, Strangers in Their Own Land, Roueche, Roueche, and Milliron describe integration as "the effort the college makes to connect and keep in touch with part-time faculty, and to help faculty feel that they are involved in the mainstream of the college's life" (1995, 92). In order to accomplish this, part-time faculty must be provided with opportunities for both formal and informal contact and communication with their departments. Ideally a mentoring system

would be established to connect part-time faculty members with full-time faculty members in their department (Roueche, Roueche, & Milliron, 1995). Other efforts which can help to integrate part-time faculty include: providing them with work space and support services; inviting them to participate in various aspects of the department's or college's work, such as curriculum development or planning activities; and recognizing the important work that they do on campus (Gappa & Leslie, 1993; Roueche, Roueche, & Milliron, 1995). In this way, the "false economies" associated with the present use of part-time faculty can be addressed.

Ending the "bifurcation" of the academic profession will require a reexamination of its current career paths and employment arrangements (Gappa & Leslie, 1997). Cohen suggests that faculty "workload is not changing . . . [and] few sustained innovative practices that would teach more students with fewer instructor-contact hours are being introduced . . .differentiated staffing . . . might serve to break the pattern (1992, 160). Colleges need to employ all of their faculty resources as wisely as possible, meaning that an experienced part-time faculty member might serve as a mentor to a new full-timer or a department chair might invite a part-time faculty member to work on curriculum development related to their area of professional expertise. As part-time faculty become more involved with instructional responsibilities outside the classroom, colleges will need to rethink who constitute "the faculty" (Gappa & Leslie, 1997).

Gappa and Leslie remind us that "part-timers are members of their departments first and institutions second" and that it is the climate of the department and its members that will determine the level of integration and effectiveness achieved in its use of part-time faculty (1993,

185). Full-time faculty members will need to become involved in the recruitment, selection, hiring, orientation, development, evaluation, and integration of the part-time faculty. They will be asked to serve as mentors and essentially as managers of the use of part-time faculty in their department.

As community colleges work to achieve full utilization of their faculty resources through the integration of part-time faculty as recommended above, their structures and practices will change following Scott's principles (1992). Greater technical complexity, in the ever increasing number of part-time faculty employed, is creating greater structural complexity, in the support services that must be provided to this group. While greater technical uncertainty, in the continuously changing nature of this contingent segment of the faculty workforce, is leading to lower formalization and centralization — responsibility for the part-time faculty is found at the department-level. In addition, by expanding their roles to facilitate the use part-time faculty in their departments, community college faculty are once again demonstrating Scott's exception for professional organizations — greater technical complexity will give rise to greater complexity of the performer.

Managing Technology

> *The network is the fundamental organizational principle of 21st century enterprises . . . academe has failed to comprehend and embrace the primacy of the network as a fundamental guiding principle for redesign . . . institutions must develop infrastructure and support mechanisms to encourage adaptation of network practices* (Dolence & Norris, 1995, 34-35)

The transition from the Industrial Age to the Information Age has created pressures for change within many organizations. As previously discussed in the context section of this paper, many businesses have utilized "reengineering" techniques in order to realign their operations with the requirements of this new era. Twigg describes the purpose of reengineering as "to use the power of modern information technology to radically redesign business processes in order to achieve dramatic improvements in performance" (1993, 35). Information technology is a term used to describe "the resources used by an organization to manage the information it needs to carry out its mission" (Griffin, 1996, 671). As indicated above by Dolence and Norris, many organizations have specifically embraced networking technology as the means by which to redesign their work processes (1995). Through the use of networking technology, these organizations are able to achieve three "critical shifts" in their application of information technology: (1) from personal to work group computing; (2) from system "islands" to integrated systems; and (3) from internal to inter-enterprise computing (Tapscott and Caston, 1993). These "critical shifts" have helped organizations to realign their practices with the needs of this new environment. Higher education is also looking to networking technology as a means of realigning its practices with the needs of its environment.

Information Technology

Higher education is a business based on the development and exchange of information (Gross, 1995; Wulf, 1995). Today, "information in all its forms is increasing nearly exponentially . . . [while] its shelf life is shrinking correspondingly . . . [yet] in spite of the information explosion . . . the use of information and dissemination in learning remains fundamentally unchanged in most settings" (Dolence & Norris, 1995, 23). The classroom remains the focal point of learning and the lecture remains the dominant method of transmitting information (Burke, 1994; Dolence & Norris, 1995). Our current instructional delivery practices cause higher education to be "extraordinarily labor intensive . . . [within] many of our institutions, 80 percent or more of the operations budget is allocated to personal services," making it difficult to achieve increases in productivity without great expense (Heterick, 1993, 1; Wulf, 1995). Throughout all sectors of higher education, leaders are looking to technology as a means of achieving much needed gains in productivity (DeLoughy, 1992).

At the same time, higher education is experiencing a shift in focus. As previously described, the Learning Paradigm has begun to take hold on many campuses. Central to this new paradigm is the importance of the individual student's learning needs. While education has long recognized that students have different learning styles, "fiscal reality . . . has prevented us from capitalizing on this knowledge . . . technology has the power to change this reality" (Gross, 1995, 30). Research has shown that computer-based education is "perceived as consistent, patient, and fair by minority students" and has been "effective at raising achievement levels of low-achieving students" (Anandam, 1989, 100). In addition, technology has been used successfully to address the needs

of physically handicapped students, adult students, underprepared students, and students who require development of English language skills (Anandam, 1989). This "new majority" of nontraditional students who require access to higher education will need flexible ways to pursue their education (Twigg, 1993). Many institutions are also looking to the use of new information technologies as a way of addressing the needs of these students.

Gilbert refers to the current use of information technology as a "slow revolution" (1996). He points to factors such as colleges' extensive investment in hardware, interest on the part of faculty organizations, and the creation of a "virtual university," as signs of the "growing recognition of the power of information technology" (Gilbert, 1996, 12). He believes that the next decade will be a critical stage in this revolution — one in which higher education's use of technology moves beyond automating operations and enhancing tasks, to the use of information technology to change its core functions (Gilbert, 1996).

Kenneth Green, Director of the annual Campus Computing Survey, reports that the "proportion of college courses using some form of information technology resource rose significantly between 1994 and 1995" (1996, 26). The use of information technology resources was "often greater in community colleges than in other sectors" and has moved beyond merely word processing or programming courses to include the incorporation of electronic mail, commercial software, simulations, and the World Wide Web into other courses (Green, 1996, 27). Green sees this as a sign that the use of information technology on college campuses is finally moving beyond the innovators and early adopters to become part of the "pedagogical mainstream" (1996, 28). In

response to Green's findings, Larry Johnson, Associate Director of the League for Innovation in the Community College, writes

> the fuel that will propel information technology . . . into mainstream use will be the ways information technology brings people together . . . as colleges consider . . . where to put limited resources for new technology, expanding and enhancing network resources and infrastructure should be at the top of their lists (1996, 31).

Networking Technology

Electronic networking provides the ability to access a wide range of information, applications, and computer resources without concern for where they are or how they connect (Tapscott and Caston, 1993). With networks that connect the campus, community, and nation, "faculty and students will be able to access and use instructional materials and information resources that include audio, full-motion video, computer software, single images, computer graphics, and formatted textual materials" (Blurton, 1994, 208). Halpern and associates believe that this technology has the potential to "completely alter the way we think, learn, remember, and communicate information" (1994, 189). Dolence and Norris state that by following the "network metaphor . . . information infrastructure will emerge as the primary delivery mechanism for educational materials" (1995, 35).

Ronald Bleed reports that networked technologies are already being used to by the Maricopa Community Colleges in the following ways: (1) as teamwork systems for collaborative learning; (2) as classroom/labs for the delivery of individualized instructional materials; (3) as remote learning systems to extend the reach of the classroom; (4) as school connections/ partnership

systems for resource sharing; and (5) as faculty-empowerment systems for developing new forms of instructional media (1993). While not all community colleges have become that sophisticated, three of the primary network information technologies used by many today for instruction-related activities are electronic mail, the Internet, and video conferencing.

Electronic mail provides the ability for people to exchange messages via networked computers. Steven Gilbert, Director of Technology Projects at the American Association for Higher Education, pinpoints 1995 as "the year when student and faculty use of electronic mail exploded" (1996, 12). Gilbert states that "more faculty members [have begun] offering their e-mail addresses to students and inviting them to ask course-related questions via e-mail" (1996, 12). While Green (1996) lists electronic mail among what he considers to be "low tech" tools, Gilbert (1996) sees the growing use of electronic mail in "conventional" courses as a sign of the incorporation of technology into the mainstream of higher education. Doucette reports that the "electronic conversations" that can be conducted via electronic mail are "surprisingly different from class discussion . . . much less dominated by the teacher . . . quieter students have the opportunity to engage in the discussion on equal terms [and] . . . distance students can enhance class discussion" — all of which can help to create a more learner-centered atmosphere (1994, 22).

The Internet is a collection of "interconnected computer networks that use a common way of sharing information" (Blurton, 1994, 193). Connecting to the Internet "permits efficient and economical sharing of powerful and expensive resources . . . [it is] possible to interactively and remotely search thousands of databases, browse through hundreds of library catalogues, [or]

participate in dozens of interactive computer conferences" (Blurton, 1994, 200). The use of this type of network technology will permit instruction to become: (1) more sensitive to individual choices as students learn to navigate their way through the resources that interest them; (2) less time and space dependent, permitting greater access to instructional materials at the learner's convenience; and (3) accessible to greater numbers of learners, as the ability to connect to the information from virtually any computer causes the space limitations of classroom size to disappear (Prokasy, 1991).

Videoconferencing technology provides the ability for a group of people in different locations to interact simultaneously through the use of two-way video (Laudon & Laudon, 1995). This particular technology is currently being used as a new form of a much older type of instruction — distance education (Gilbert, 1996). As of 1994, 80 percent of community colleges offered some form of distance education program (Parrott, 1995). Distance education has historically been used to provide access to instruction, through television or videotapes, to those who could not attend classes. The growth of this type of education reached a significant milestone in 1994, when the Public Broadcasting System announced that "there now exist enough pre-produced telecourses in a sufficient range of subject areas to offer an entire 60-hour associate's of arts or sciences degree program" (Cross, 1994, 22). This announcement was believed to mark the arrival of distance education into the mainstream culture of higher education (Cross, 1994). The use of video-conferencing technology as another avenue for providing distance education allows learners the option of receiving interactive instruction in remote locations, such as their work site or another campus.

Impact of Technology

The changes in information technology will be felt by many businesses and industries, but they will be especially important in enterprises such as higher education whose core processes focus on communication. As a whole, these individual network-based technologies are also referred to as communications technologies because the area in which they have the greatest impact is in shaping the ways in which people communicate. The core process of higher education, teaching and learning, is entirely dependent on the ability to communicate information and ideas. The introduction of these types of communication technologies into higher education is expected to transform the ways in which teaching and learning take place (Doucette, 1994). Anadam notes that "one-way communication, with the faculty conveying information to their students, has been the primary model of education for hundreds of years" (1989, 106). The ability of new network/ communications technologies to provide interaction between students and faculty, students and their peers, and students and the information itself, is creating a new model of education (Anadam, 1989).

Three important aspects of this new model of education are the ability to customize learning, the ability to provide collaborative learning experiences, and the diffusion of learning (Needham, 1986; Anadam, 1989; and Batson & Bass, 1996). With access to instructional and research materials via the Internet and to faculty members via e-mail, learners will have more control over the content, sequence, and pacing of their education (Anadam, 1989). Dolence and Norris report that "research shows that learning tools and more individualized systems create dramatic positive effects upon learner performance, as measured by mastery of subject matter material" (1995, 78).

Among the benefits of this type of instructional technology, McKinney notes "increased levels of student participation and interest" (1996).

The ability to communicate and share information in a variety of formats, such as text, sound, or image, with other learners creates "more opportunities for team learning" (McKinney, 1996). The extension of this ability to include access to other learners and scholars around the world via the Internet can "help to create new learning communities" (Bleed, 1993). Both will serve to shift the focus of teaching and learning away from content only to include the importance of the process of learning and the creation of more collaborative learning experiences (Batson & Bass, 1996). Finally, the combination of new distance learning technologies and electronic mail capabilities is expected to "enable learning to occur . . . at any time and place" (Dolence & Norris, 1995, 44). The ability to provide "just-in-time" education is expected to create a shift from the current emphasis on location-based access to education — at the campus, in the classroom — to diffused access to education (Needham, 1986; Sliwa, 1994). Gross envisions "a future where connectivity is more important than geography" in the development of new sources of education (1995, 33).

Obstacles

Among the obstacles to this new model of education, Gilbert lists: (1) limited and uneven access to equipment, software, and support services; (2) fragmented institutional planning; (3) fragmented support services; and (4) underestimating the difficulty of faculty adoption of new technologies (1996, 11). Green reports that "data point to the importance of infrastructure . . . as critical catalysts for innovation and for the integration of technology in instruction" and that "data

suggest that instructional use will continue to rise, accompanied by growing demand for expanded and enhanced infrastructure resources and services" (1996, 26).

For many colleges the primary obstacles to the use of new technologies are the rapid pace of technological innovation and providing the appropriate support structures. McKinney lists one of the primary limitations in using technology is that "nothing remains up-to-date for any substantial length of time" (1996). In an article predicting the costs of computer technology, Jacobs states that we should assume that personal computers/workstations will become obsolete six years after they are purchased (1995). He cautions that "our dependence on technology implies a long-term commitment and a long-term cost" (Jacobs, 1995, 34). Sliwa reminds us that "technology is maturing at a pace that exceeds most organization's abilities to adapt" (1994, 10).

The rapid pace of technological change is a driving force behind the second obstacle to the use of technology in teaching and learning — the lack of support services. While colleges struggle to keep the latest technology in their classrooms, "new campus investments in computers, video equipment, and software are most often not matched by new additions to technology/media support service staff . . . [while] the gap between demand and availability of support services widens" (Gilbert, 1995, 16). Gilbert declares that this condition has become so prevalent within institutions today that it is creating a "support service crisis" (1996). In a recent article in the Chronicle of Higher Education, the results of the 1996 Campus Computing Survey showed that "providing adequate user support" was the number one concern among information technology administrators at public colleges (Guernsey & Young, 1997, A35). The support services that

faculty require in order to utilize technology effectively include more technical assistance, library resources, training/development, and access to pedagogical expertise (Gilbert, 1996). Addressing these user support issues "represent a major financial, operational, and technical challenge for most institutions" (Green, 1996, 26).

Prokasy states that the use of technology-intensive equipment will require colleges to shift their current allocation of resources in two ways: (1) a larger percent of budget will go to non-personal services, such as equipment and supplies; and (2) within personnel there will be a larger ratio of technical support people to faculty (1991, 113). In her review of the limitations to the use of technology in community colleges, McKinney states:

> most colleges cannot hope to support these technologies under their current budgetary constraints . . . technology as an add-on is not economically feasible . . . some individuals contend that if changes are made to the curriculum and teaching methods, colleges will be able to financially support the restructured curricula which utilized technology . . . [this] means redefining the role of the faculty in the educational process (1996).

Faculty Use

McKinney continues, addressing faculty concerns at the prospect of being replaced by technology, stating that "current research shows that technology is most successful when used alongside a knowledgeable instructor" (1996). Needham's review of the role of faculty in using communication technologies reported that as "new technologies have the potential for spreading learning more pervasively throughout our culture, there is the likely possibility of a greater need for faculty as educational specialists" (1986). Many writers believe that these new technologies can be used to leverage faculty time so as to increase the amount and quality of interaction that they have with individual students (Needham, 1986; Sliwa, 1994; Gross, 1995; and Wulf, 1995).

If instructional materials are available to students via their local network and the Internet, faculty can shift their focus from the dissemination of information to student groups to give their attention to how individual students are progressing with the material. Faculty who are supplementing their current instruction with the use of communication technologies in order to achieve more personal contact with students, such as through electronic mail, report that their workload has actually increased (Gilbert, 1996).

Doucette contends that the key to achieving the transformation necessary to incorporate the use of communications technologies into community colleges is for faculty to "retain critical control over the content, design, standards, and assessment of student learning" while relinquishing control over the delivery mechanisms (1994, 23). Dolence and Norris list several roles for faculty in working with this new technology (1995). First, "in the face of the information explosion, the synthesis and rapid dissemination of new knowledge will emerge as an even more important position in the spectrum of scholarship" (Dolence & Norris, 1995, 62). Second, "faculty will serve as learning navigators . . . [to] guide learners in identifying and fulfilling their learning objectives" (Dolence & Norris, 1995, 64). Third, faculty architects will be required who can "design curriculum . . . that will enable knowledge navigation . . . and to specify the evaluative tools to assess performance and demonstrate when individuals have achieved mastery of particular topics" (Dolence & Norris, 1995, 63). Fourth, students will require learning mentors, to assist them in "sorting out relationships and higher-order concepts" (Dolence & Norris, 1995, 63). Finally, faculty will be called upon to "assess and certify the mastery of learners" (Dolence & Norris, 1995, 63).

Prokasy warns that "technology cannot play a major role in any level of education without significant institutional change" (1991, 109). We must seek "effective combinations of teaching approach, application of technology, instructional materials, [and] facilities" (Gilbert, 1996, 18). In doing so, community colleges will once again need to follow Scott's principles (1992). The greater technical complexity created by the rapid pace of technological change must be met by greater structural complexity in the amount and nature of support services provided to the technical core. At the same time, increased technical complexity is also creating a more complex professional performer, as faculty take on the new roles of synthesizer, navigator, architect, mentor, and certifier for the Information Age.

Summary

This paper provides an overview of the most recent literature available which describes the changing role of college faculty. Its purpose is to provide a summary of the topic for use by the community college practitioner in planning for changes that are taking place as we move into the Information Age. In doing so, it has specifically focused on answering the question "How can the structure of the technical core be modified so as to accommodate more demanding tasks?" (Scott, 1992). In order to answer this question, we first began by examining the changing nature of the why, what, who, when and where of education in community colleges today.

In "The Context" and "Faculty" sections of this paper, the impetus — the "why" — for change in higher education, community colleges, and within the professoriate itself was discussed. The need for changes in the role of community college faculty has been primarily driven by forces outside of higher education. The intersection of the economic requirements of the Information Age and the demographic makeup of American society have created a "human capital crisis" which higher education is expected to help address (Fjeldstad, 1990). At the same time, colleges themselves are finding that their traditional structures and mechanisms for delivering education are straining under the pressure of these two forces.

For community colleges today, the "what" of education has shifted from teaching to learning. In the section titled "Managing Student Learning," this paper describes the Learning Paradigm, a concept developed by Barr and Tagg to describe higher education's attempt to realign its practices with the needs of its external environment (1995). The shift to a Learning Paradigm is

expected to impact an institution along six dimensions: purpose, learning theory, criteria for success, productivity, teaching/learning structures, and the nature of roles (Barr & Tagg, 1995). Under the Learning Paradigm, faculty are expected to act as designers of learning environments, facilitators of learning, classroom researchers, members of interdisciplinary teams, and brokers of individualized educational experiences.

As described in the section titled "Managing Part-time Faculty," the "who" of education in community colleges has shifted over time to include an increasing number of part-time faculty. Similar to other organizations in the service sector, colleges have increased their use of part-time employees in response to forces in their environment. Gappa and Leslie believe that this trend will continue in colleges well into the next century (1993). The increased use of part-time faculty has the most significant impact on the work that faculty typically conduct outside the classroom, such as student advising, curriculum development, and department or institutional planning activities (Cohen, 1992). In order to insure that the work of part-time faculty becomes integrated with the overall objectives of the institution, full-time faculty must become more involved in managing the work of the part-timers. Full-time faculty members need to participate in the recruitment, selection, hiring, orientation, and development of the part-time faculty, while part-time faculty members are expected to become increasingly involved in the work conducted outside the classroom.

The "when" and "where" of community college education are being dramatically changed with the advent of information technologies. The section titled "Managing Technology," describes how

networking technology will permit instruction to become more individualized, less time and space dependent, and more accessible to greater numbers of learners (Prokasy, 1991). The traditional educational model of "one-way communication" delivered at a singular location is being replaced by the model of "just-in-time" education delivered to multiple locations (Needham, 1986; Anadam, 1989; Sliwa, 1994). Working with technology in educational environments will require faculty to adopt new roles as information synthesizers, knowledge navigators, curriculum architects, learning mentors, and certifiers of content mastery.

How

In his article "Future Work: Faculty Time in the 21st Century," William Platter describes time as "the most important fungible resource any of us has to work with in the academy" (1995, 23). Platter argues that all of the changes taking place in the nature of education point to the need for changes in the way that faculty members spend their time (1995). He advises that we must "manag[e] faculty time as the single most important asset we own" in order to achieve the types of fundamental changes required of colleges for the twenty-first century (Platter, 1995, 32). In order to act as synthesizers, knowledge navigators, designers of learning environments, facilitators, mentors, classroom researchers, members of development teams, brokers of individualized educational experiences, managers of the part-timers, and certifiers of content mastery, faculty members will have to develop new forms of expertise and give up other roles which currently consume their time.

In an article titled "The End of the Job," William Bridges explains that "part of the reason there is so little time is that most of today's organizations are trying to use outmoded and underpowered organizational forms to do tomorrow's work" (1994, 74). Bridges states that "jobs" as we know them are a social artifact of the Industrial Age when mass production and large organizations became the norm (1994). In the Information Age, customized production is creating what he describes as the "de-jobbed" worker (Bridges, 1994). As education moves from using the mass production techniques of the Teaching Paradigm to the more individualized techniques allowed by the Learning Paradigm and information technologies, faculty work is also becoming "de-jobbed." The "de-jobbed" worker is more likely to move through "temporary work situations" where work is defined by the demands of the particular project (Bridges, 1994). Work will be shared and accomplished by teams (Bridges, 1994). Colleges' increased reliance on and the growing need to integrate part-time faculty into the work of the institution is evidence that education will not escape this trend. Most importantly, the de-jobbed worker will be virtually self-managed (Bridges, 1994).

Faculty as Managers

While faculty members have long been considered professionals by Scott's definition of a "more highly qualified professional performer," they are also members of a bureaucratic organizational structure in which they reside at the bottom of the hierarchy — responsible for the work of the organization (Scott, 1992, 253; Altbach, 1994). In the Teaching Paradigm, where the student was considered to be the product of the institution, faculty assumed the role of worker, delivering instruction to the student in much the same way as a factory worker would add components to a

product on a production line (Barr & Tagg, 1995). Under the Learning Paradigm, with the help of part-time faculty and information technologies, faculty can assume the more complex role of process manager, while the student takes on the role of the worker.

Management is the

> set of activities (including planning and decision making, organizing, leading, and controlling) directed at an organization's resources (human, financial, physical, and information) with the aim of achieving the organizational goals in an efficient and effective manner (Griffin, 1996, 5).

In Bridge's "de-jobbed" world, process managers will "oversee . . . a reengineered process . . . their skills [will be] performance management and work redesign" (1994, 74). Each of the new roles that faculty members are expected to fulfill require some type of management skills. Planning involves establishing goals for the learner and deciding how best to achieve them and is evident in the roles of designer and curriculum architect (Griffin, 1996). Organizing roles are used to "determine how best to group activities and resources," such as balancing the use of technology for individualized educational, the role of part-time faculty, and the use of more traditional educational delivery mechanisms in order to create a learning experience (Griffin, 1996, 8). Leading roles, such as facilitator and mentor, are used to motivate students in their work (Griffin, 1996). Finally, controlling is the process by which a manager "monitor[s] and correct[s] ongoing activities to facilitate goal attainment" and is evident in the roles of classroom researcher and certifier (Griffin, 1996, 8).

Structure of the Technical Core

Scott states that "the prime source of core complexity is the nature of the work being carried out — the demands made by the technology on the structure" (1992, 226). As the amount of complexity increases, the structural complexity of the organization will also increase (Scott, 1992). In the case of a professional organization, as the amount of complexity increases, the complexity of the performer will increase as well (Scott, 1992). In each of the areas which impact faculty work described in this paper — student learning, part-time faculty, and technology — it has been demonstrated that as technical complexity increases, both the organizational structure of colleges and the skills required of faculty will become more complex.

Within an organization, the technical core resides at the center of two opposing forces, the division of labor and coordination (Scott, 1992). Division of labor, also referred to as job specialization, is "the degree to which the overall task of the organization is broken down and divided into smaller component parts" (Griffin, 1996, 294). Coordination refers to "the process of linking the activities of the various departments of the organization" (Griffin, 1996, 309). As technical uncertainty — the variability of items or the extent to which their behavior can be predicted — increases, formalization and centralization within the organization will decrease (Scott, 1992).

As community colleges attempt to provide a more individualized learning environment for students, the amount of technical uncertainty in their work will increase. Following Scott's rule for technical uncertainty, the structure of faculty work should become less formalized and less

centrally controlled. As the division of labor becomes less explicit, more faculty generalists will be required. In his article titled "Reengineering Teaching for 21st Century Learning," James Davis states, "the disciplines have never been very good for addressing broader issues or developing holistic perspectives . . . there will be a new emphasis on making connections and on synthesizing disparate sources of information into new knowledge" (1995, 17). He goes on to predict that the discipline-based departments around which faculty work is currently organized "will be superseded by programs, centers, institutes, and various matrix arrangements that cross traditional departmental lines" (Davis, 1995, 21). Instructional specialties, such as designing curriculum, preparing presentations, managing the learning process, and assessing learning outcomes, will replace the current emphasis on disciplinary specialties (Lorenzo & LeCroy, 1994).

Centrally developed coordinating structures which govern the lives of faculty today, such as the academic calendar, will be superseded by the way faculty, either as individuals or in teams, choose to delineate their own work. As the course, credit, and term, become essentially self-navigated learning units with periodic assessment and intervention by the faculty member, the coordination of learning activities will need to be achieved at a much lower level within the organization. Barr and Tagg state that in following the Learning Paradigm, there is "no one 'answer' to the question of how to organize learning environments . . . in fact, the Learning Paradigm requires a constant search for new structures and methods that work better . . . and expects even these to be redesigned continually" (1995, 20). Platter states "the emerging model of faculty time is likely to

look more and more contractual and to involve faculty in setting specific group goals . . . with negotiated performance measures (1995, 32)

With the structure of the technical core shifting from disciplinary specialties to instructional specialties and the responsibility for coordinating the work of the core becoming more decentralized, the importance of managing each of the college's subsystems becomes critical. In systems theory, an organization is viewed as "an interrelated set of elements functioning as a whole" (Griffin, 1996, 49). "A primary objective of management, from a systems perspective, is to continually re-energize the organization to avoid entropy" (Griffin, 1996, 51). As discussed in the Context section of this paper, many community colleges currently suffer from entropy, or "lack-of-fit" with their environment (Lorenzo & LeCroy, 1994). This summary will conclude with suggestions for the community college practitioner on ways to begin to overcome their current state of entropy.

Organizational Change

For most community colleges practitioners, addressing this "lack-of-fit" between the institution, its faculty, and their environment will essentially become a matter of managing organizational change. Griffin outlines steps to follow when taking a "systems view" to change (1996, 355).

- Recognition of the need for change
- Establishment of goals for the change
- Diagnosis of relevant variables
- Selection of appropriate change technique
- Planning for implementation of the change
- Actual implementation
- Evaluation and follow-up

Each step can be repeated as needed and the cycle as a whole can be applied and reapplied to the various subsystems throughout the organization. Griffin states that "a manger who, when implementing change, follows a logical and orderly sequence . . . is more likely to succeed than is a manager whose change process is haphazard and poorly conceived" (1996, 355).

In addition, managers must understand the causes of individuals' resistance to change and how to manage that resistance. The primary reasons that individuals resist change are: (1) feelings of uncertainty; (2) threatened self-interests; (3) different perceptions about the need for change; and (4) feelings of loss (Griffin, 1996). Techniques recommended to manage resistance include participation, education and communication, facilitation, and force-field analysis (Griffin, 1996). Griffin describes participation as "often the most effective technique for overcoming resistance to change" (1996, 357). In order to participate effectively, faculty and staff must be educated about "the need for and the expected results of an impending change" (Griffin, 1996, 358). Professional development and staff training activities play an important role in this process. Facilitation of the change process includes "making only necessary changes, announcing those changes well in advance, and allowing time for people to adjust to new ways of doing things" (Griffin, 1996, 358).

Many of the authors of the literature included in this paper believe that the type of incremental change process described above will not be sufficient to bring about the type of change that community colleges will require in order to remain in synch with the needs of their environment.

They believe that the individual change processes used within the various subsystems of the organization will need to be incorporated into a larger "reengineering" process (Lorenzo & LeCroy, 1994; Dolence & Norris, 1995; Platter, 1995). Recall that reengineering involves "the radical redesign of all aspects of a business to achieve major gains in cost, service, or time" (Griffin, 1996, 362). Dolence and Norris believe that this can be accomplished through "transformation-guided strategic planning" (1995, 88). They offer the following guidelines for practitioners to utilize as they begin reengineering efforts on their own campuses (Dolence & Norris, 1995, 88):

- Establish transformative expectations — not revolution
- Raise everyone's knowledge base
- Formalize an inclusive decision process
- Align resources (focus attention) with strategies, tactics, goals, and objectives
- Redirect existing processes to transformative ends
- Utilize leverage points for change
- Communicate models of success
- Support agents of transformation, convert skeptics
- Focus on strategic decisions that facilitate transformation

Finally, Lorenzo and LeCroy remind us that one of the critical themes for change in the Information Age will be "thinking holistically" (1994, 16).

> *Moving toward a more holistic perspective is an essential prerequisite for envisioning the dimensions of fundamental change . . . American higher education has historically placed high value on autonomy and academic freedom . . . the transition to the Information Age is bringing with it a sense of connectedness and interdependence . . . institutions must come to view themselves as part of a much larger socioeconomic system . . . likewise, the various units within the college must place greater emphasis on how they contribute to the betterment of the total institution . . .*

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